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(54) Plough

(57) A plough comprises a frame (10) and several plough beams (11) pivoted to the frame, each plough beam being provided with at least one plough body for cultivating the ground. The frame is coupled by a drawbar (12) to a linkage (13) which can be connected to a towing vehicle. A means (18) for transmitting movement between the linkage (13) and the frame (10) is acted on partly by a first adjustment means (20) for parallel movement of the frame (10) at the same time as the plough bodies are moved in parallel to adjust the position of the first ridge and, partly by a second adjustment mechanism (22) to change the working width of the plough while maintaining the direction of the plough bodies.

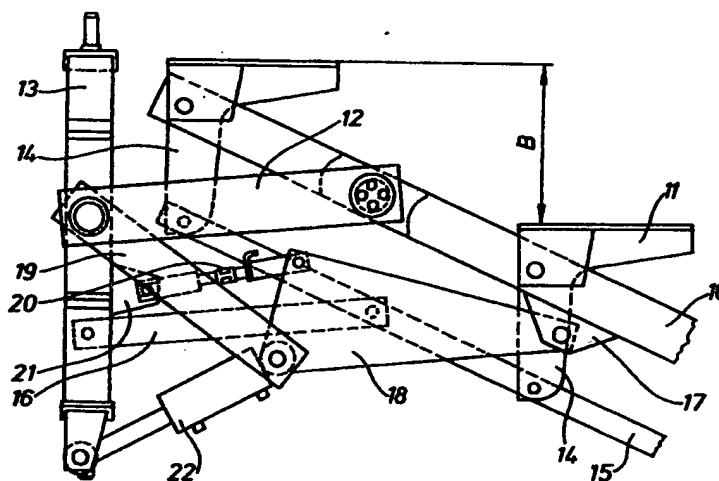


Fig.1

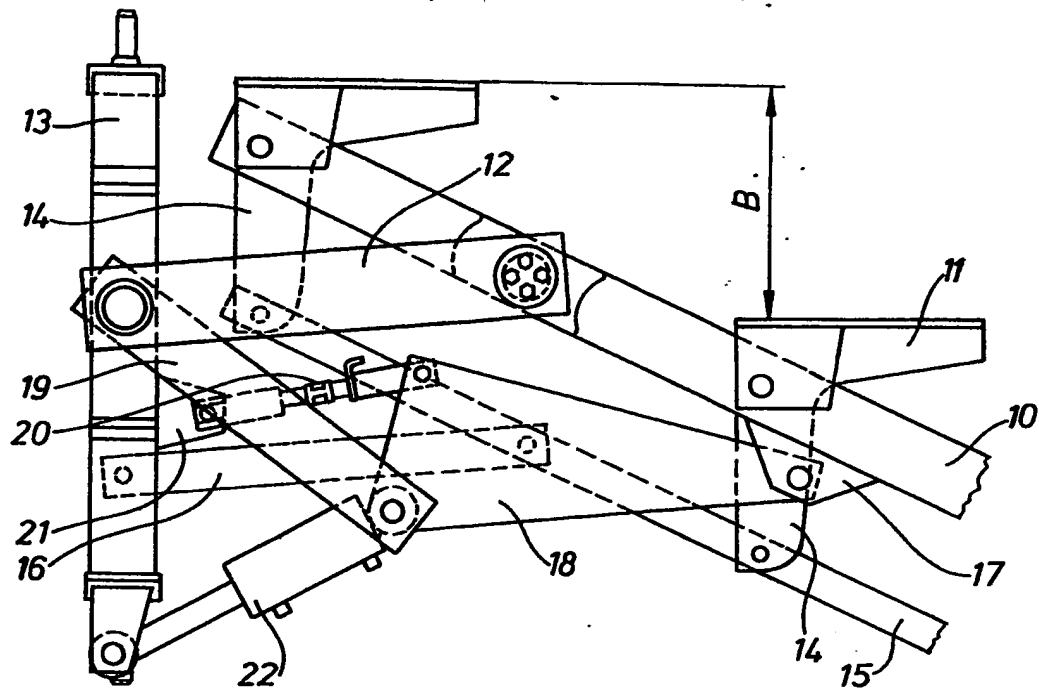


Fig. 1

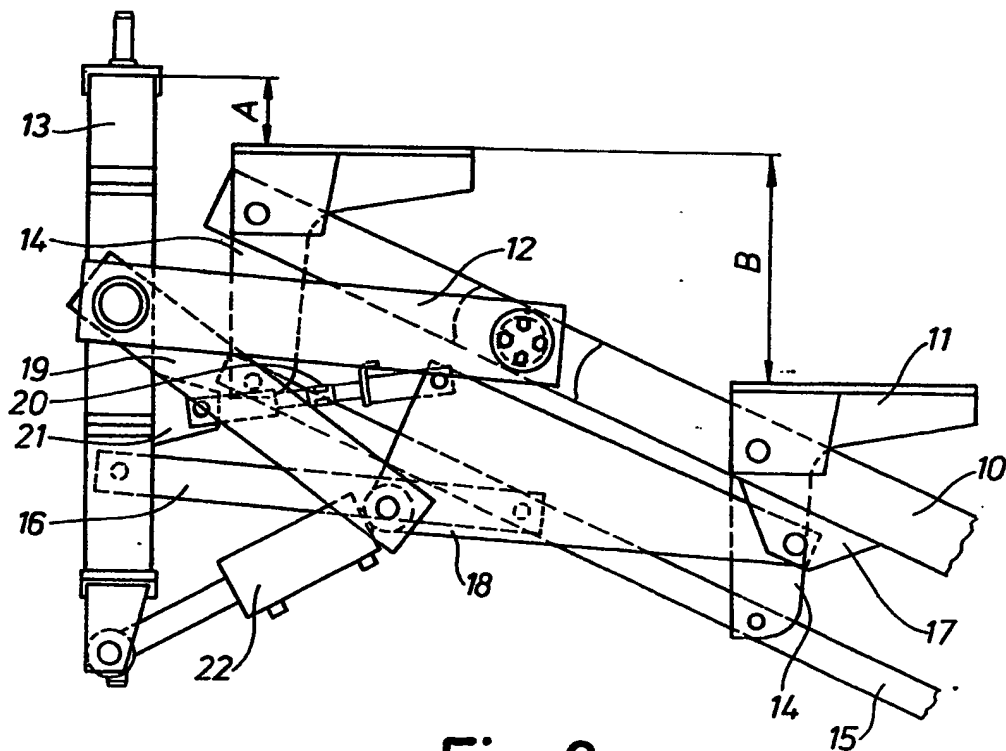


Fig. 2

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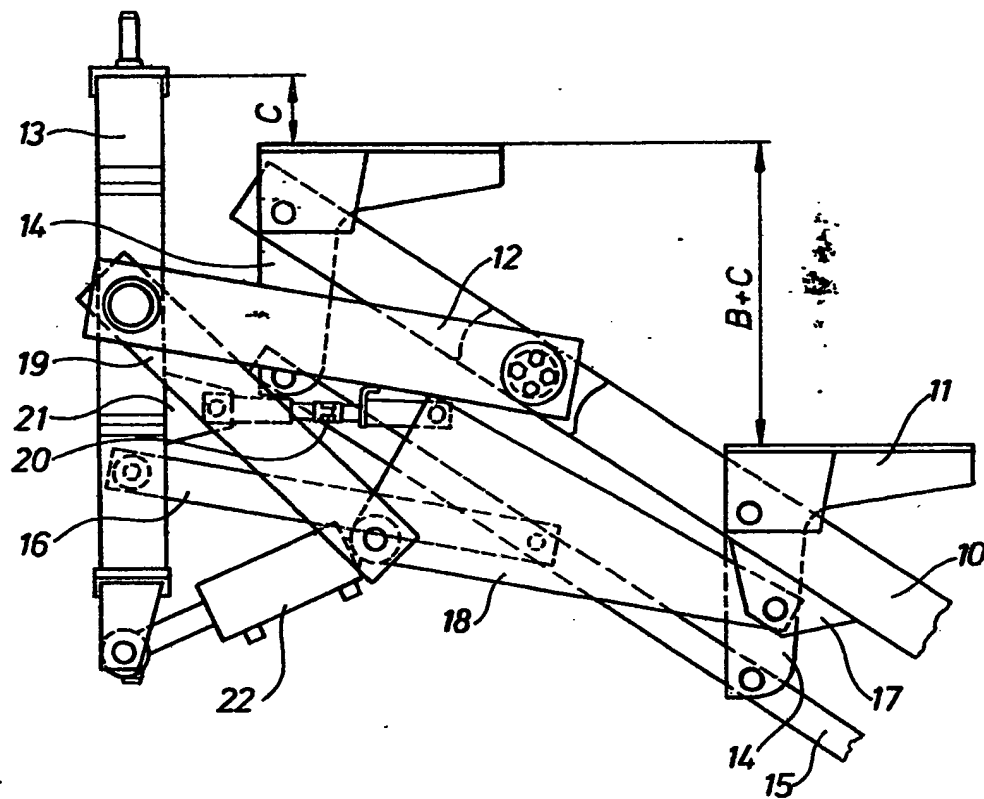


Fig. 3

SPECIFICATION

Plough

This invention relates to a plough comprising
5 several plough beams pivoted to a frame, each
plough beam being provided with at least one
plough body for cultivating the ground, the frame
being coupled by a drawbar to a linkage which is
connected to a towing vehicle.

10 Ploughs with possibilities to adjust the working
width by changing the width of all the ridges
simultaneously and to adjust the position of the
plough sideways for fitting the distance between the
wheels of the towing vehicle or with respect to
15 occasional inclinations sideways are previously
known for instance by EP 62 734 and Norwegian
Patent 149 906.

The first mentioned publication shows a plough in
which adjustment of the width is made by means of
20 hydraulic cylinder and by maintaining the set
direction of the plough bodies the plough bodies
being directed by means of a stay which is parallel
to the frame and to which all plough beams are
turnably connected. For adjusting the position of the
25 first ridge a separate screw-guide arrangement is
used by means of which the complete plough frame
can be moved parallel sideways. This solution can
however only be used in such trailer ploughs where
the fastening point of the first body in the frame has
30 the same distance from the pivot point of the frame
as the fastening points of the plough bodies have
from each other. This means that the center of
gravity will be placed comparatively far at the back
of the plough which is negative from each point of
35 view. In particular this is the case with ploughs
having safety release arrangements. Another
drawback with the solution is that the suggested
guide arrangement is expensive to manufacture
because of the high requirements precision and
40 accuracy of finish.

What has been said above means that an
arrangement of the kind referred to above has its
limitation with respect to heavy, trailed ploughs i.e.
reversible ploughs or such ploughs which are
45 provided with release means. In order to make it
possible to use ploughs with for instance 3—5
shares in such connections it is necessary that the
point of gravity is placed as far at the front as
possible i.e. that the first plough body is placed as
50 near as possible with respect to the fastening point
of the plough in the towing vehicle. Also very short
movements of the gravity point could in this
connection be critical for the function of the device.

The Norwegian patent publication 149 906 shows
55 a semiconducted plough with a frame which via a
drawbar is fastened to the linkage, several plough
bodies being placed in front of as well as behind the
fastening point. When adjusting the width of the
plough also here the direction of the plough is
60 maintained by means of a parallel stay. Moreover
the plough is provided with an adjustment means
for the position of the first ridge, this means for
obvious reason being designed without any
thoughts about the position of the gravity point.
65 Thus, a movement of the front part of the frame

towards the part of the field which has been
ploughed means that the first plough body swings
rearwards which means that the gravity point
comes unnecessarily far back.

70 The plough according to the invention is so
designed that the width and position with respect to
the towing vehicle can be adjusted by means of the
same interconnected adjustment means, the point
of gravity always being placed as far ahead as
75 possible independent of the width of the plough, or
the position of the first ridge. Adjustment is by
means of a mechanism which is simple and robust
and hence cheap in production. This is achieved by
a device according to invention as defined in the
80 following claims.

An embodiment of the invention will now be
described with reference to the accompanying
drawings, in which Figure 1 is a plan view of a
device according to the invention, Figure 2 is a
85 similar view to Figure 1 where the first ridge has
been adjusted and Figure 3 is a similar view with
another setting of the width.

As appears from the figures, the device comprises
a plough frame 10 with several ploughbeams 11
90 which are pivoted to the frame. The plough beams
each support a plough body (not shown) or, in the
case of reversible ploughs, two plough bodies, and
can be provided with a release arrangement which,
on running into rigid obstacles in the ground, allows
95 the plough body to be lifted out of the ground and
then lowered again.

The frame 10 is coupled by a drawbar 12 to a
linkage 13 which is intended to be fastened in a
towing vehicle (not shown) by means of a
100 conventional threepoint linkage. Each plough
beams has a bracket 14 by means of which the
inclination of the plough beam to the frame can be
adjusted. These brackets are also pivoted to a stay
15 which is parallel to the frame. A first link arm 16
which is pivoted at one end to the linkage, and at the
other to the stay. Further the frame is provided with
a lug 17 to which a means 18 for transmitting
movements is turnably secured. This means is
105 shaped as a triangular plate which via a second link
arm 19 is connected to the linkage. The means for
transmitting the movement is also pivoted, via a
first adjustment mechanism 20 in the form of a
screw, to a lug 21 on the linkage. A second
adjustment mechanism 22 is connected between
110 the pivot of the second link arm 19 in the movement
transmitting means 18 and the linkage 13.

Adjustment of the first ridge is made by setting
the first adjustment mechanism 20. If the
adjustment mechanism is extended, this means that
the means 18 for transmitting the movement will
120 turn clockwise about the connecting point between
the second link arm 19, the second adjustment
mechanism 22 and the means 18 for transmitting
the movement. This in turn means that the
connecting point between the means 18 for
transmitting the movement and the frame 10 will be
125 moved downwards in Figure 1. Because the
drawbar 12, the second linkarm 19, the means 18 for
transmitting movement, and the frame 10 together
form a parallelogram the complete frame will be
130

moved parallel downwards in the figure. During this movement the first linkarm 16 will swing clockwise about its fastening point in the linkage the connecting point between the stay 15 and the first linkarm 16 mainly being moved vertically downwards in the figures thereby maintaining the direction of the plough beams 11. Thus, this means that the setting of the first ridge with respect to the linkage changes the distance A at the same time as the width B of the ridges is maintained.

The second adjustment mechanism 22 operates as follows:

Supposing that the length of the adjustment mechanism is reduced. The second link arm 19 in the parallelogram which is formed by said linkarm, drawbar 12, frame 10 and means 18 for transmitting movement is then swung clockwise about its fastening point to the linkage 13 causing a corresponding change of angle of the frame 10, which means that the working width of the plough increases. Adjustment is made at the same time as the first ridge is moved the distance C, which means that distance between two successive plough bodies is increased with this distance. The direction of the plough bodies is maintained, as is described above, by means of the first link arm and the stay.

CLAIMS

1. Plough comprising a frame, and a plurality of plough beams pivoted to the frame, each plough beam being provided with at least one plough body for cultivating the ground, the frame being coupled by a drawbar to a linkage which is connected to a towing vehicle, characterized in that a means (18) for transmitting movement is placed between the linkage (13) and the frame (10), the means for

transmitting movement being acted on partly by a first adjustment mechanism (20) for moving the frame (10) parallel to itself, the plough bodies being kept parallel to each other, and partly by a second adjustment mechanism (22) so as to change the working width of the plough while maintaining the direction of the plough bodies.

2. Plough according to Claim 1, characterized in that each plough beam (11) has a bracket (14) which is connected to a stay (15) which is parallel to the frame and which via a first link arm (16) is connected to the linkage (13) for turning the plough bodies simultaneously with respect to the frame.

3. Plough according to Claim 1 or 2, characterized in that the means (18) for transmitting movement is pivoted to one end of a second link arm (19) the other end of which is pivoted to the linkage (13).

4. Plough according to Claim 1—3, characterized in that the points at which the means (18) for transmitting the movement is pivoted to the first and second adjustment mechanisms (20, 22) and a plough frame (10) respectively form a triangle.

5. Plough according to Claim 3 or 4, characterized in that the fastening points of the second linkarm (19) and the second adjustment mechanism (22) at the means (18) for transmitting the movement are placed on the same vertical axis.

6. Plough according to any preceding claim, characterized in that the plough means (11) are provided with release mechanisms.

7. Plough according to any preceding claim, characterized in that the first adjustment mechanism (20) comprises a screw whereas the second adjustment mechanism (22) is a hydraulic cylinder.